SAFETY, HEALTH, & ACTIVE TRANSPORTATION

Steve Miller
LivableStreets Alliance, founding board member
Healthy Weight Initiative, Harvard Sch. Public Health

LivableStreets Rethinking urban transportation

A. Public Health

B. Transportation Safety

C. Transportation & Health

D. Moving On….Green Routes

A. Public Health

- Treatment – Individually dealing with an existing injury or illness.
- Prevention – Reduction of risk and damage.
  - Preventive Medicine: early detection & treatment.
  - Vaccination. Water/Sewer Systems. Gun Control.
- Wellness – Holistic strengthening of well-being
  - Individual vs. Populations;
  - Short-term vs. Long-term
  - Improving the environment
  - Shaping decision-making context
    - Creating good "defaults"
      - » Easier, cheaper, acceptable

Safety…Health

Safety & Health Can Both Be Preventative

- Safety: Preventing Injury; Reducing Severity.
- Health: Wellness in all ways
  - ("health in all policies")

PRIMARY PREVENTION

* Built Environment
* Social Environment
* Natural Environment
* Work Environment
* Food, Shelter, Security

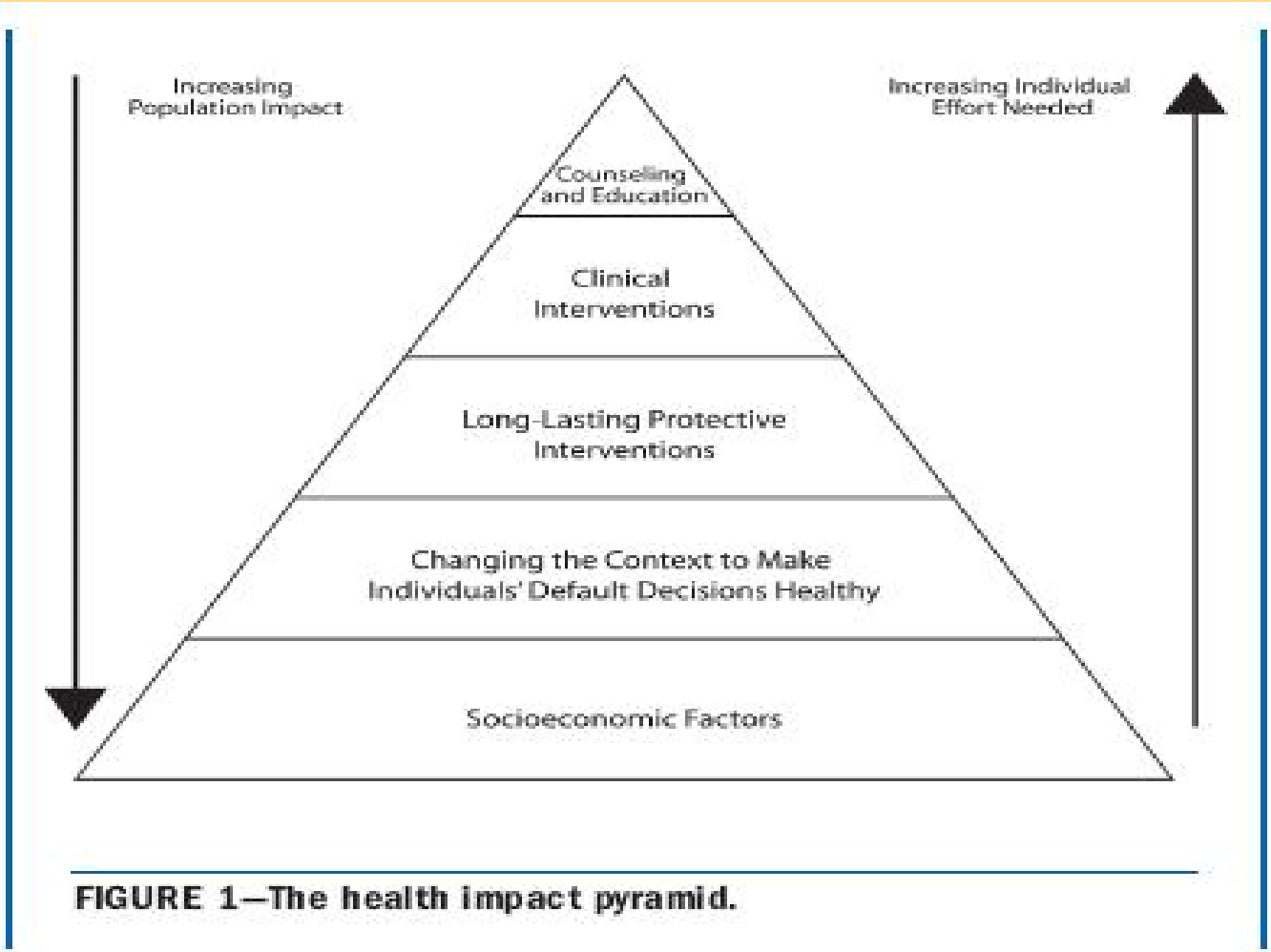
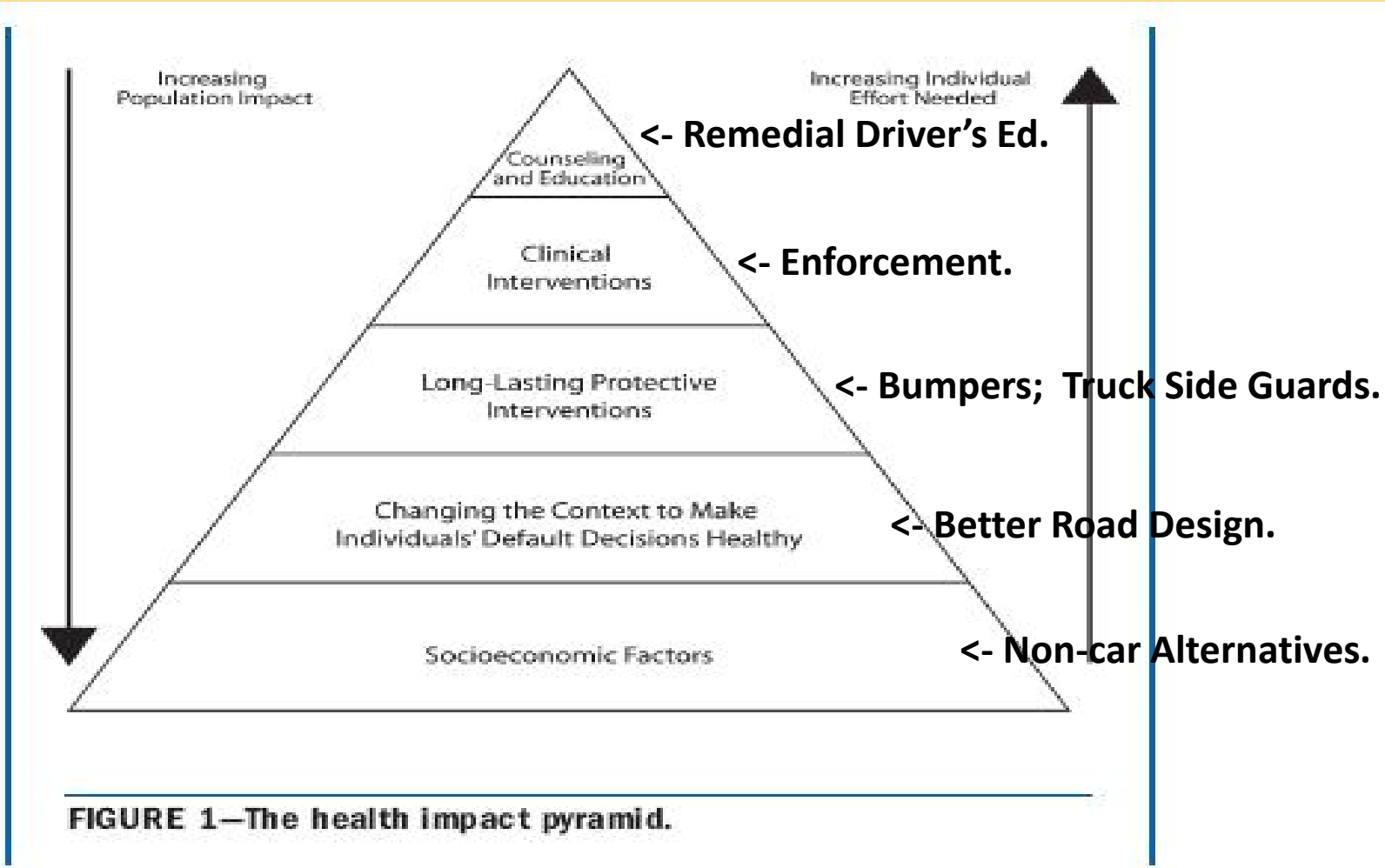


FIGURE 1—The health impact pyramid.

Dr. Thomas Frieden, Director, CDC



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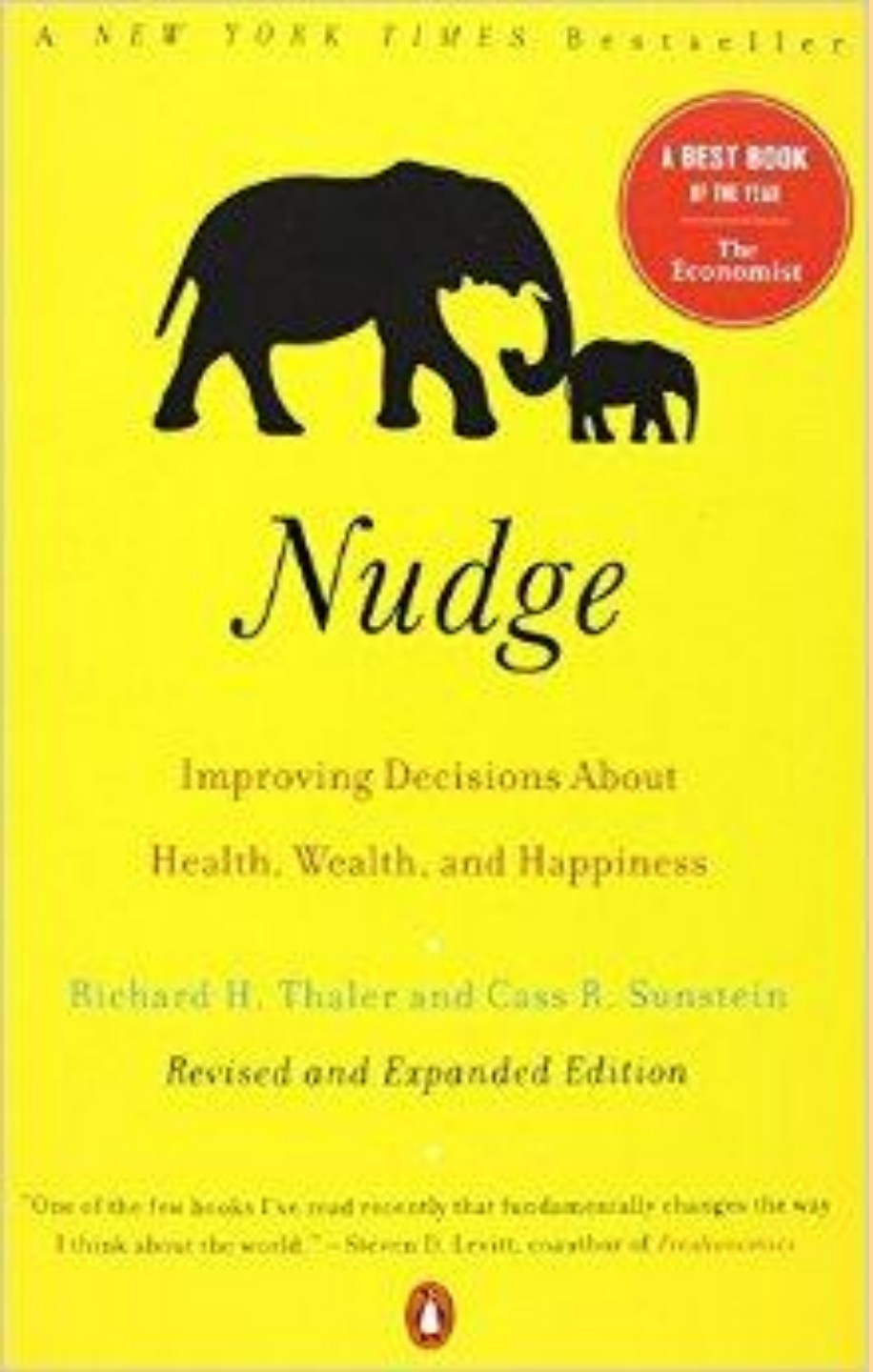


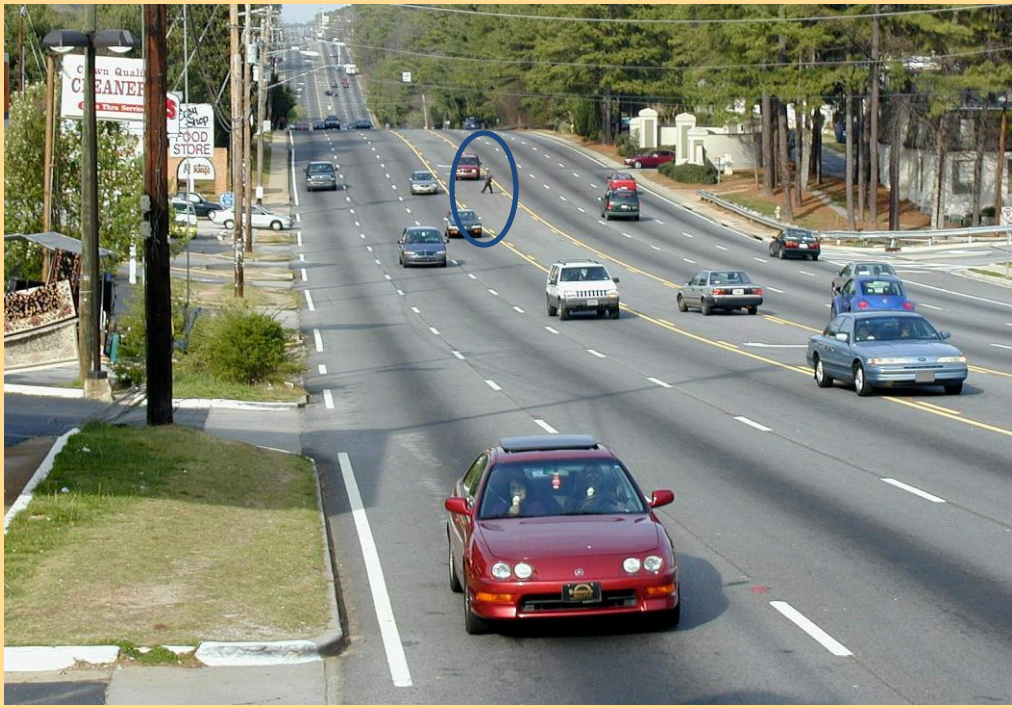
- **Every decision & action choice we make is influenced by the context in which it happens – through suggestion, structure, or default options.**

- **Why not "nudge" people positively by setting good "defaults" that are easy, cheaper, available, culturally applauded, automatic….**

- **"Libertarian paternalism"(!?)**

B. SAFETY

- Leading cause of death among persons 1-24 years old
- Each year in the United States, motor vehicle crashes account for:
  - — 42,000 deaths
  - — 3.4 million nonfatal injuries
  - — 24 million vehicles
  - — estimated $200 billion in costs
- Compared with occupant injuries, pedestrian injuries are more severe, with a fivefold higher likelihood of death among those injured
- 4,881 pedestrians were killed in traffic crashes within the United States.

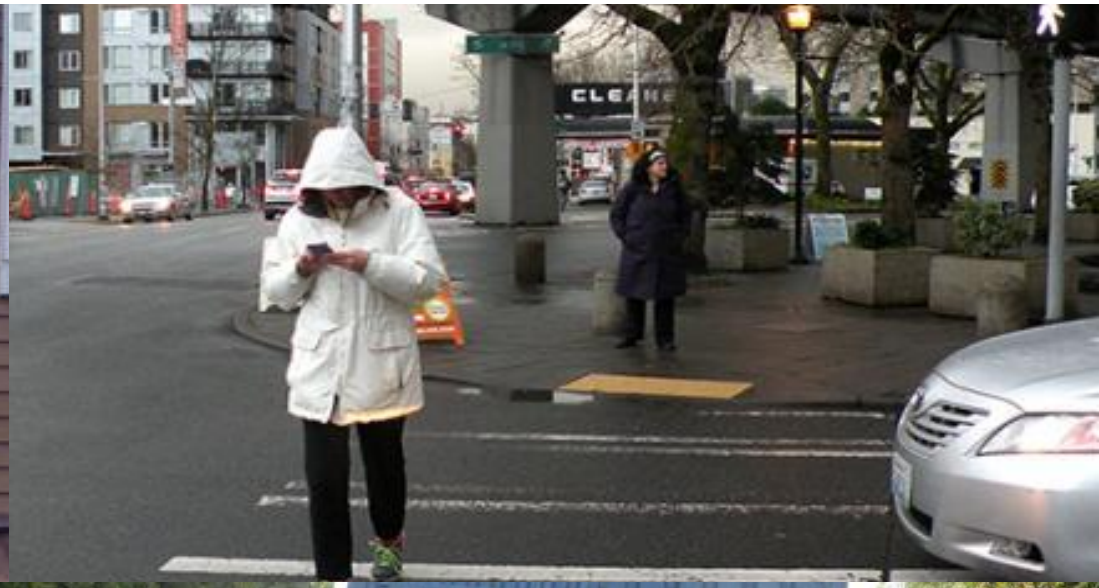


B. SAFETY

1. Individual Behavior
   - …Changing Consciousness
2. Vehicles & Equipment
   - ….Trucks, Bikes and Us
3. Roads
   - “The pavement made me do it.”
   - Speed
   - Separation (and Togetherness)

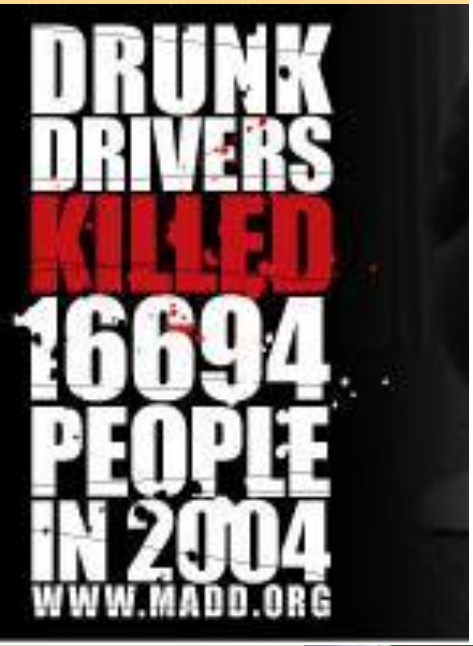
1. SAFETY: Behavior

Good luck….



(re)Licensing; Enforcement

Behavior: Changing Consciousness Through Public Campaigns



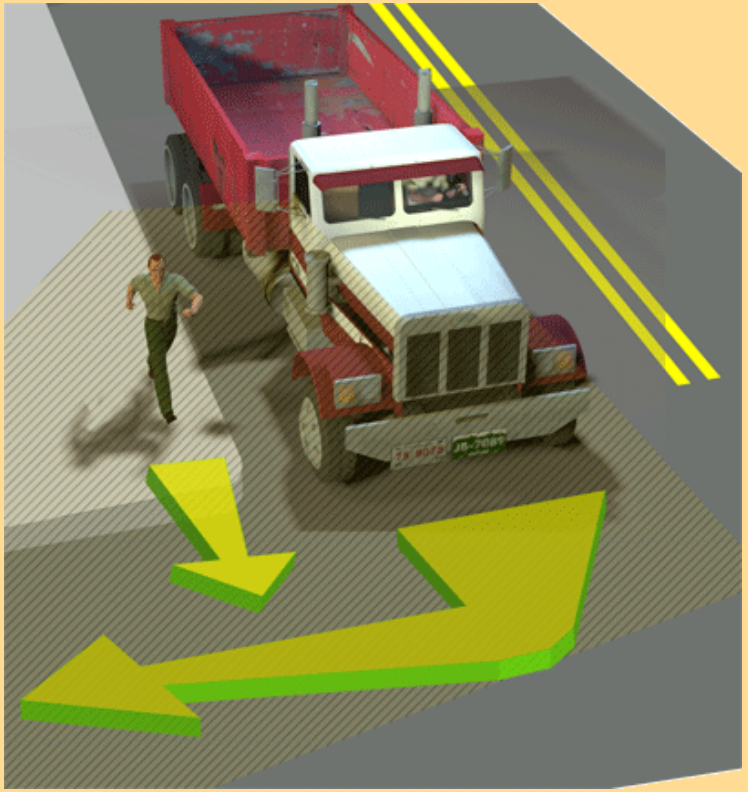
2. SAFETY: Vehicles/Trucks

Trucks are only **4%** of vehicles in US…
but cause **11%** of cyclist fatalities, **7%** of pedestrian fatalities
In urban areas the disparity is higher…
London: trucks = **4%** of vehicles; **53%** of cyclist fatalities.

In 2012, 5 out of the 7 Boston metro area cyclist fatalities involved heavy-duty vehicles.

½ of cyclists killed by large trucks …
¼ of pedestrians killed by trucks…
…first hit the side of the truck
…then slide under rear wheels as vehicle drifts during a right turn
…then get crushed.

TRUCK PROBLEMS



TRUCK ACCIDENT PREVENTION

TO LET PEDESTRIAN/CYCLISTS KNOW…

Outside Warning Stickers. These inform/remind cyclists of the dangers of being on the nearside of an HGV, especially at junctions.

Outside Side-of Vehicle Turning Blinkers. Like turn lights on car mirrors, these let someone who has passed the rear lights that a truck is turning.

Automatic Activation of Side-of Vehicle Turning Blinkers. Turning lights begin blinking whenever steering wheel turns a set amount.

Automatic Outside Audible Turning Warning. Whenever steering wheel turns a set amount a warning alarm or recording begins playing on the appropriate side.

TRUCK ACCIDENT PREVENTION

TO LET DRIVER KNOW…

Blind Area Mirrors. A set of mirrors that show low-front and side views where driver lacks a direct line of sight. Convex for sides; Cross-over for front.

Fresnel Lenses. Low cost plastic lenses that provide rough visibility of an area where driver lacks a direct line of sight, often used on the passenger window.

Proximity Sensors. Fitted to the side (or front) of the vehicle. An audible alarm or in-cab visual display is triggered when a vulnerable road user is detected in a danger zone.

Blind Area Cameras. Directional or 360 degree cameras can be fixed to the side, rear and front of a vehicle, relaying a picture to the driver via a monitor in the cab. These images may be recorded; this can assist in determining responsibility for any incidents.

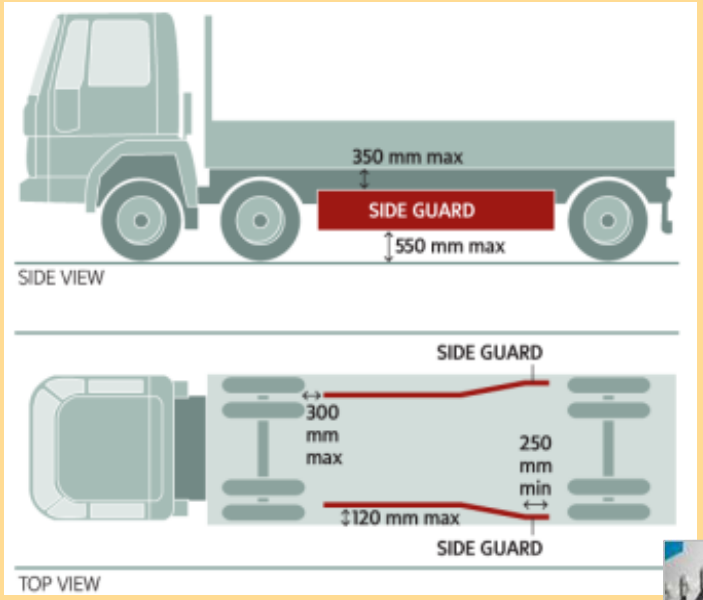
Integrated collision avoidance technology. Different technologies can be integrated into a common multi-sensor platform.

TRUCK INJURY REDUCTION

SIDEGUARDS

61% decrease in cyclist fatalities in UK in side-impact crashes with large trucks after national sideguard law implemented

20% decrease in same types of pedestrian fatalities



SAFETY: People & Bikes As Vehicles -- Training & Equipment

3. Safety: ROAD DESIGN SPEED

“The pavement made me do it...”

WHAT THE INTERSTATE HAS TAUGHT US

Wide lanes, gentle curves, no sight-line obstructing hills, limited entering/exiting locations with long ramps, no visual distractions other than large and uniform directional signage, and the absence of slower or more vulnerable traffic.

Other structural contributors: slide-resistant pavement, break-away sign and light poles, more lighting, and better guardrails.

The Interstate is safest when it is "error tolerant" and forgiving of driver distraction.

STREETS vs HIGHWAYS

ARTERIALS:
Local or regional collector roads typically "designed with the forgiving roadway features intended to enhance the safety of motorists"

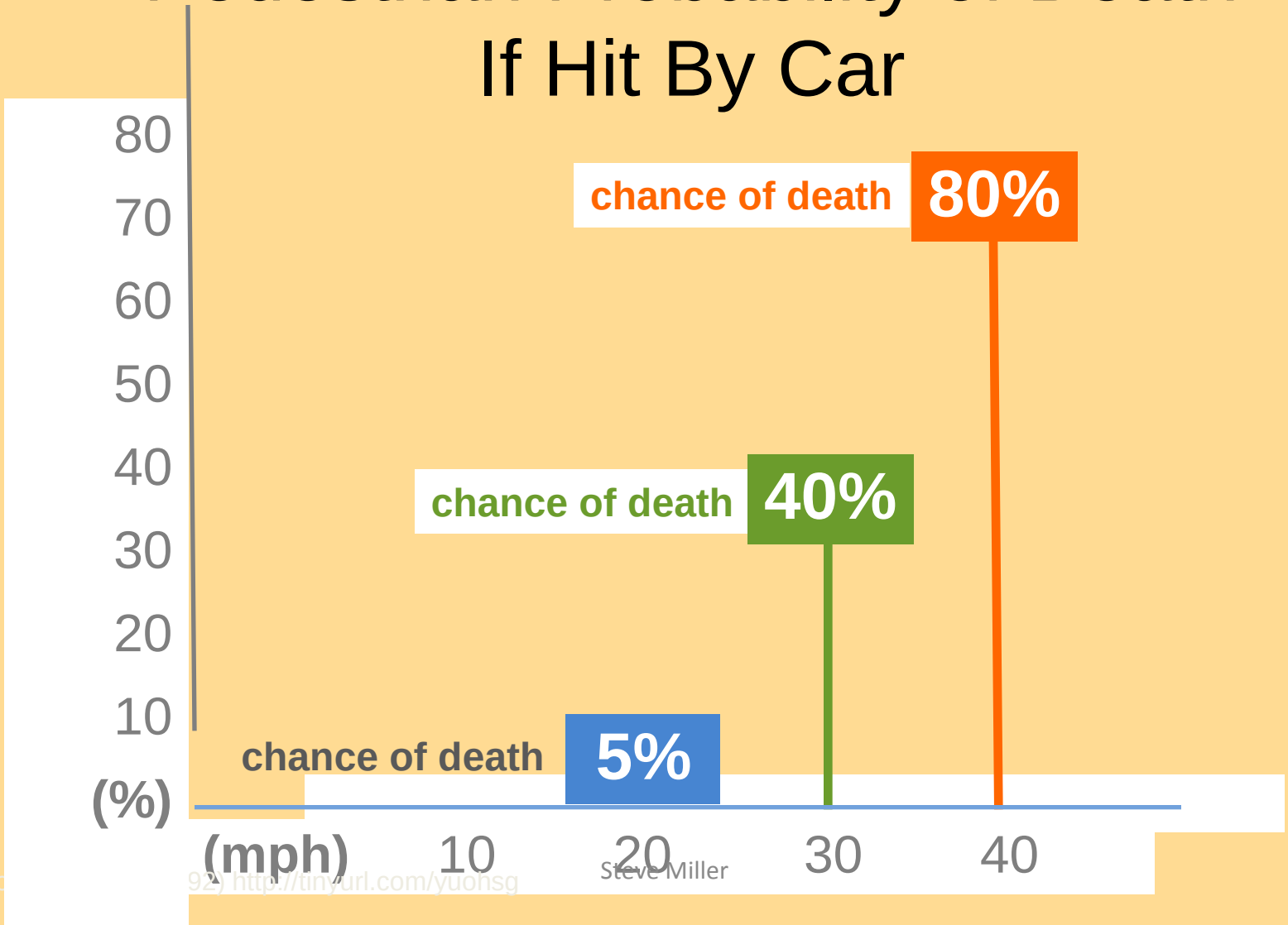
> More Arterials = Higher accident rate!
"Each additional mile of arterial…was associated with a 9.8% increase in motorist crashes."

Increased frequency and severity of crashes involving pedestrians. "Examinations of the spatial distribution of pedestrian-[injuring] crashes show that they cluster along urban arterials…"
Journal of the American Planning Association



SAFETY = SLOWING DOWN

Pedestrian Probability of Death If Hit By Car

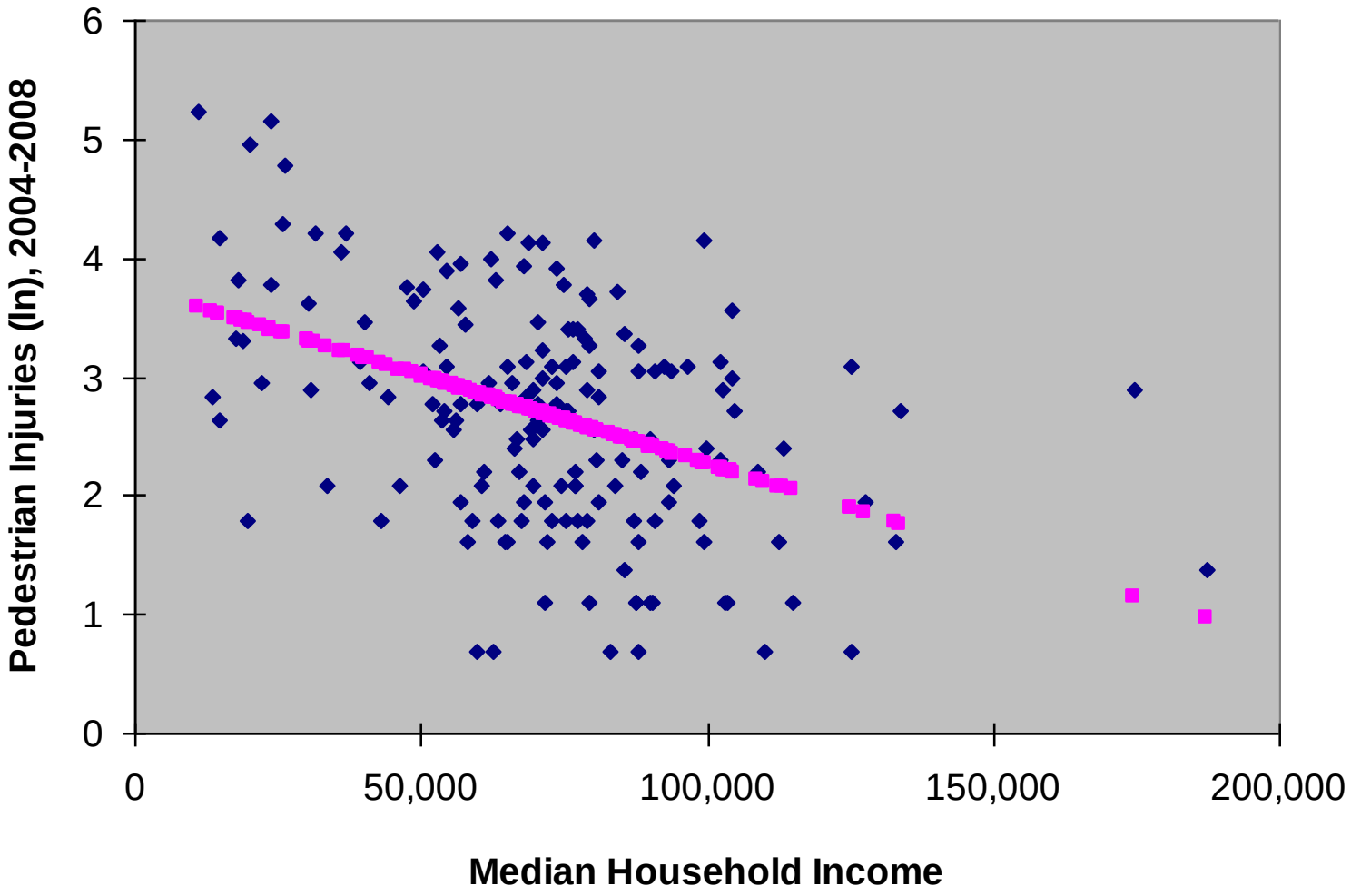


Source: 92) http://tinyurl.com/yuohsg

“An increase in the average speed from 20 to 30mph was associated with 7.6 times the risk of [child]pedestrian injury [in high risk locations].”

Source: Jacobsen, et al. 2000, ITE Journal

Pedestrian Injuries by Median Household Income: San Francisco Census Tracts

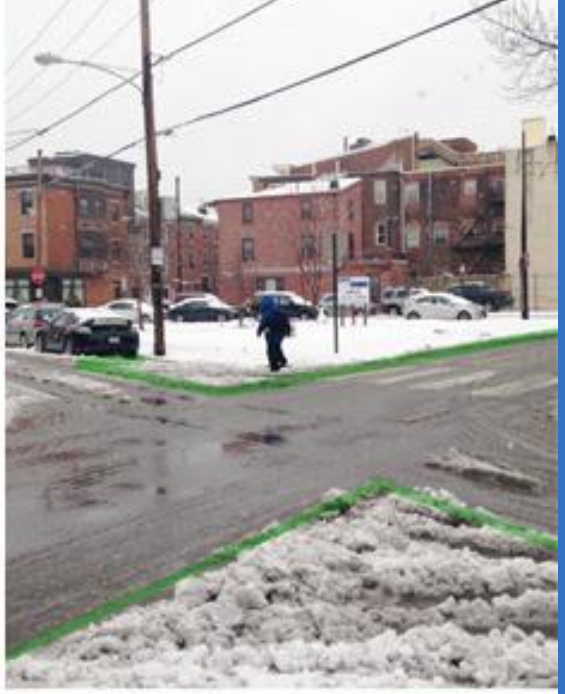


SAFETY = SLOWING DOWN

NARROWING THE LANE –
EVEN IF ONLY VISUALLY!

ROAD & LANE DIETS

Three Lanes to Two;
Four to Three;
– plus room for everyone else.

BIKE LANES

Buffered Bike Lane

Left-side Bike Lane

Contra Flow Bike Lane

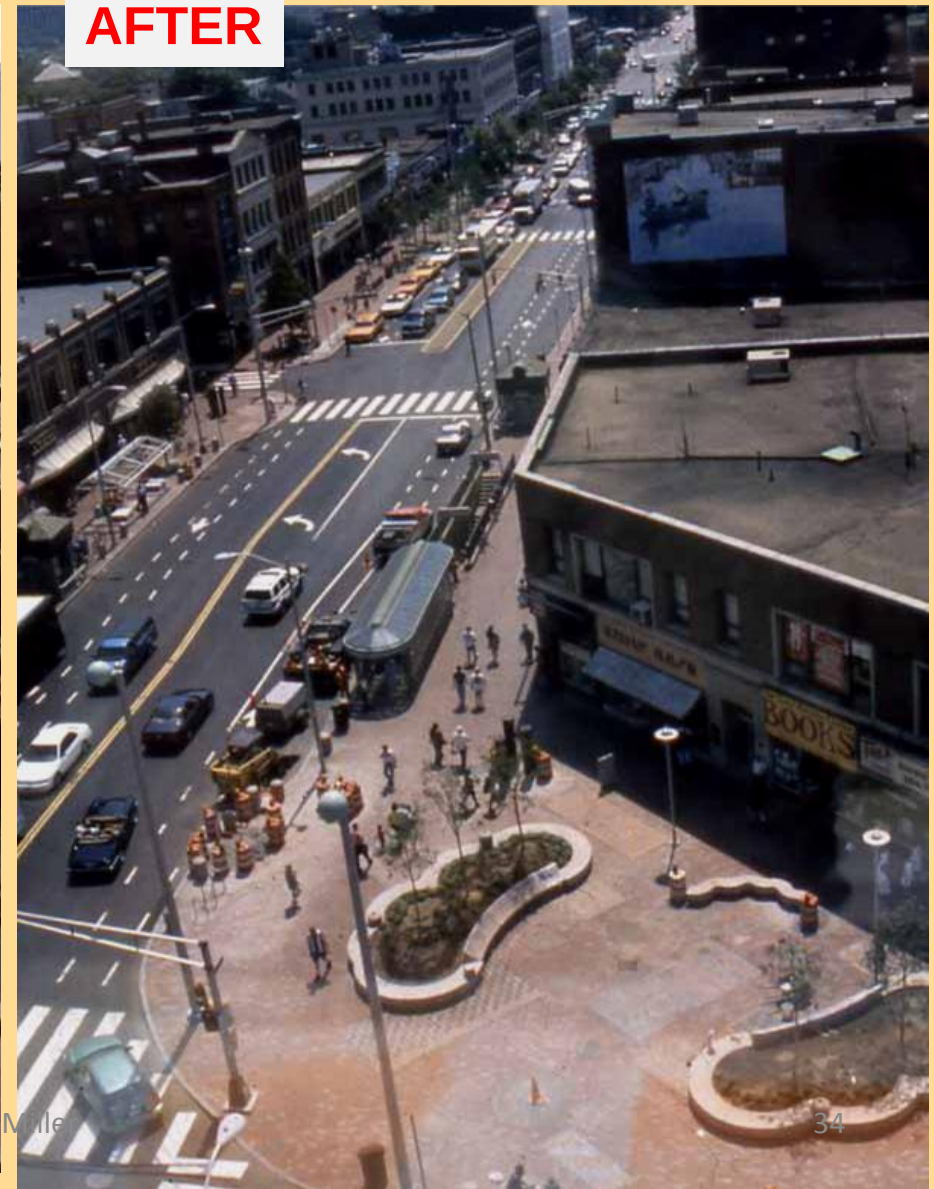
SAFETY through SEPARATION

CYCLE TRACKS

A “road” for each mode – and a turning lane.

DUTCH DESIGN:
4-WAY INTERSECTION

Mass. Ave. road diet, 1996



SAFETY through INSECURITY
!! or ??

“The only way to make a busy road intersection safe is to make it feel dangerous.” Joost Váhl

SHARED SPACE

Poynton, UK

No traffic signs. No painted lines in the roadway. No curbs.

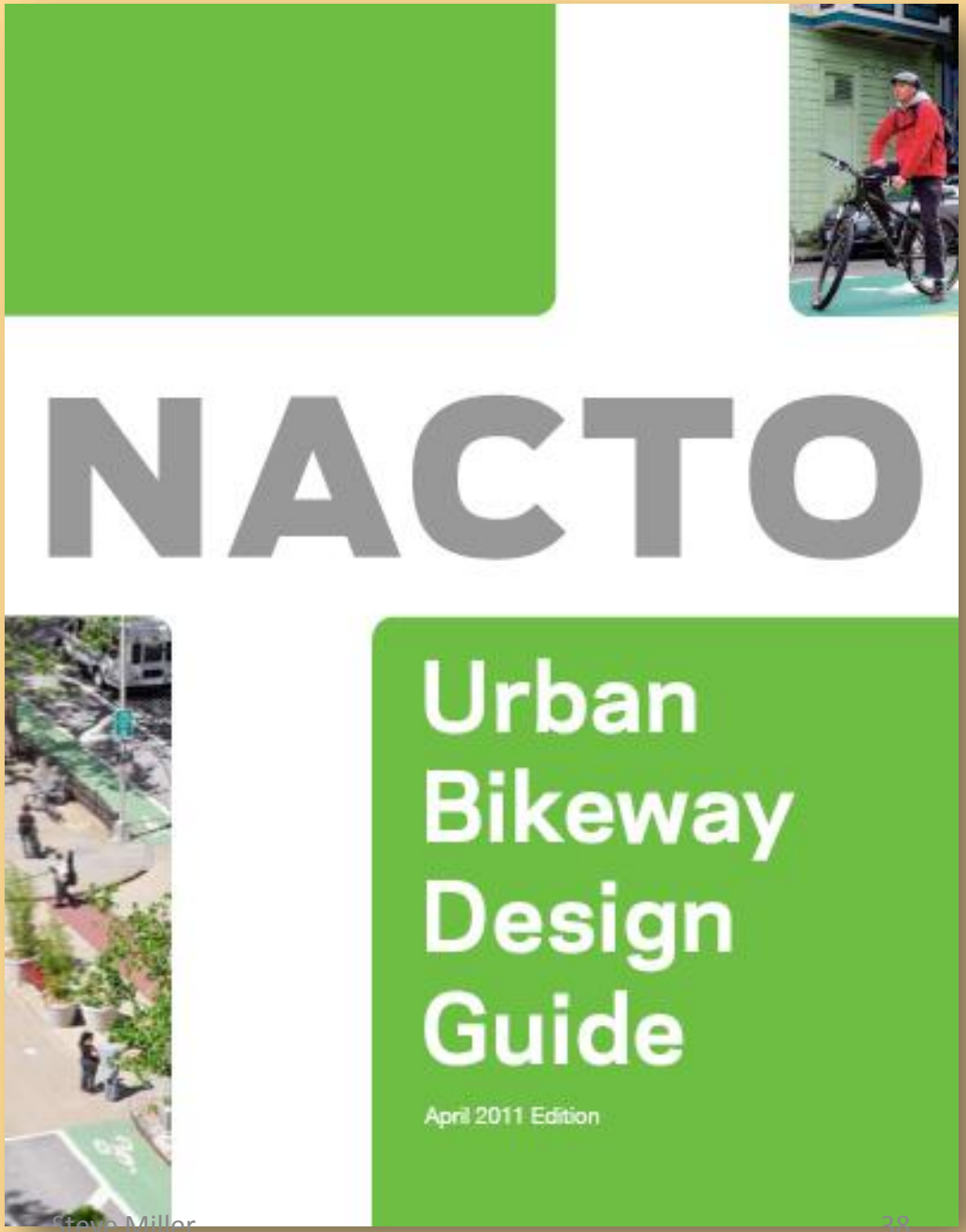
"No traffic lights. And 26,000 vehicles passing every day through a traditional village center with busy pedestrian traffic…. Pavements of varying colors and textures are the only signal as to which type of road user belongs where…."

SAFETY = BEING TOGETHER


BACK-IN ANGLE PARKING

Supplemental Design Guidance For Cities

US DOT Secretary LaHood: The NACTO guide is *"an extraordinary piece of work that is long overdue."*

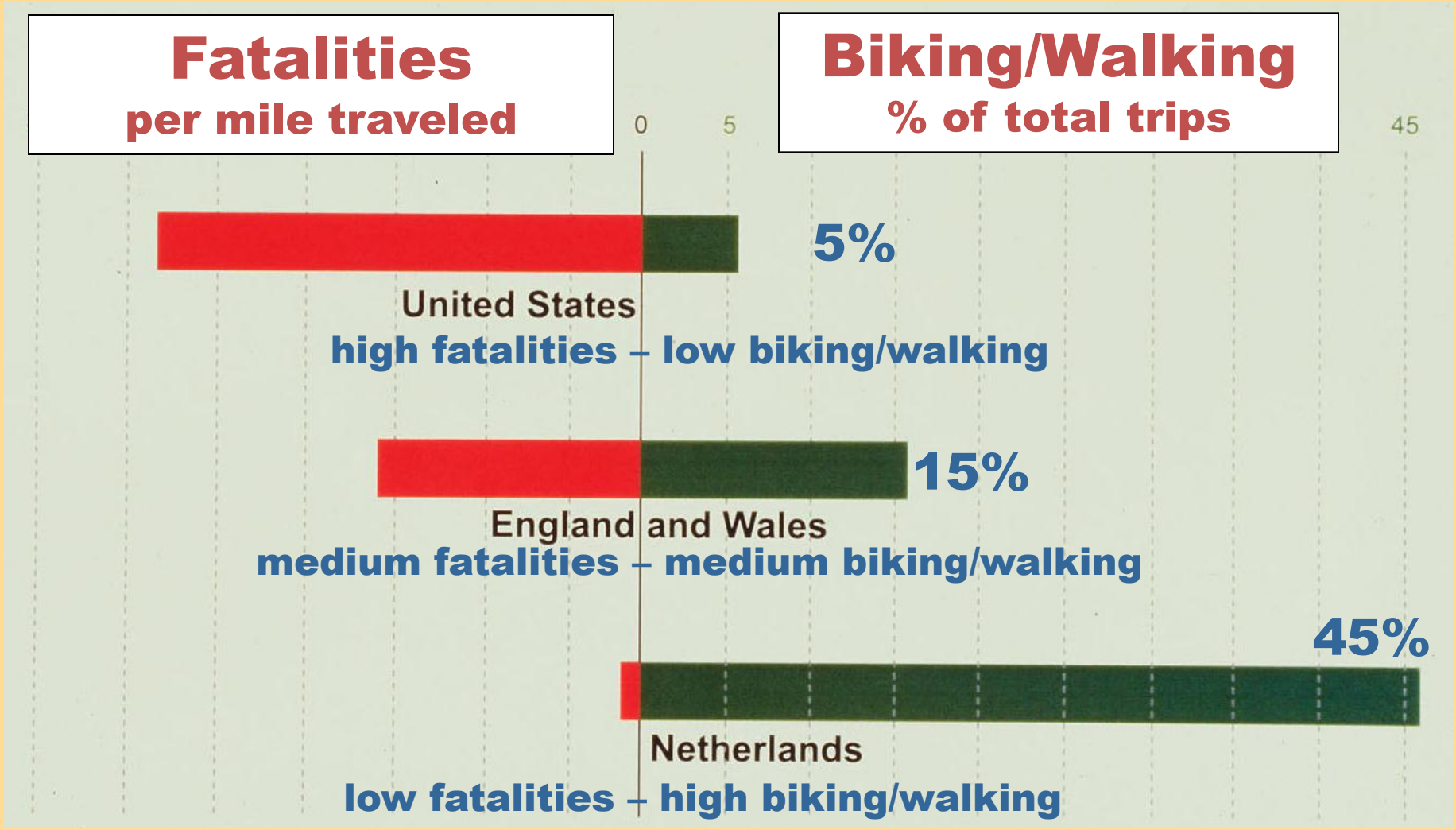


COMPLETE STREETS – A SPACE FOR EVERYONE


Complete Streets are Safe Streets
PARK
1
2
3
4
5
6

CONTEXT SENSITIVE – TRAFFIC STRESS -- SLOWER TRAFFIC

SAFETY IN NUMBERS



C. Transportation & Health

1. Physical Activity
2. Air & Water Quality
3. Land Use, Climate, Energy
4. Social Interactions: Community & Personal Connections
5. Access To Services
6. Economic Opportunity & Sustainability

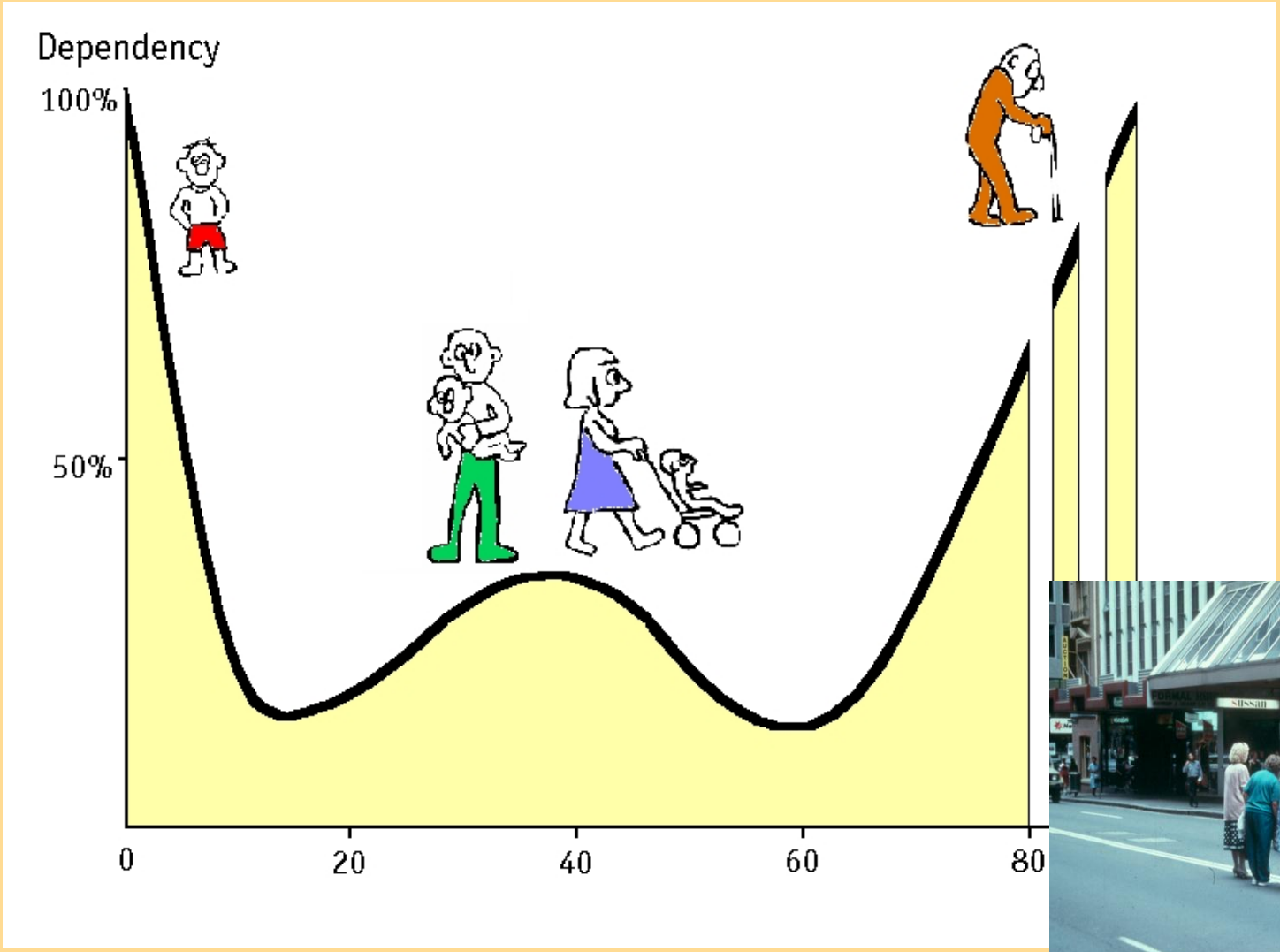
1. Physical Activity Guidelines

- Health: Moderately intense exercise – at least 30 minute 5 days a week, or vigorous exercise at least 20 minutes for 3 days a week.
  - Increases heart rate, causes sweat
    - Brisk walk, moderate speed cycling, light jog
- Weight Control: 60+ minutes daily
  - To loose weight, change diet
  - To maintain healthy weight, increase activity
- Spare Time vs Daily Routine

Lack of Physical Activity…

- High blood pressure; Stroke; Heart Disease
- Osteoarthritis & back pain
- Several types of cancer
- Diabetes
- Depression; Mental acuity; Alzhizmer's
- Overweight & Obesity
- Social and Economic Struggle

Human lifecycle of Agility & Mobility



CYCLING & HEALTH

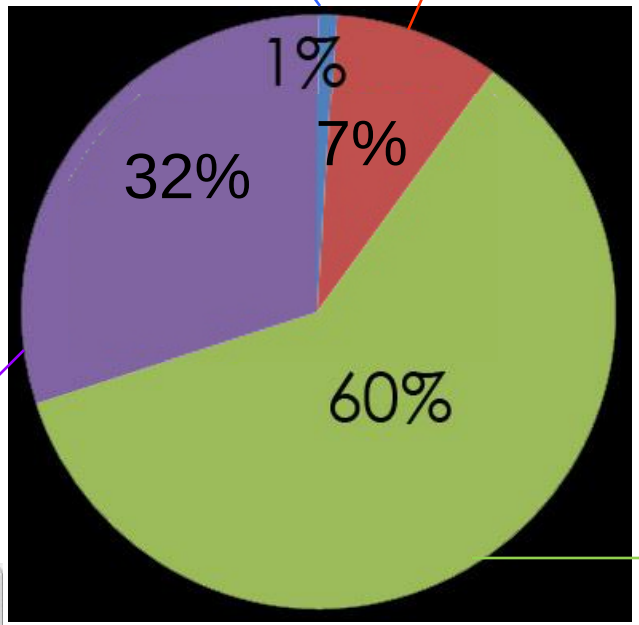
- “Over a 10 year study span, non-bikers, even if they were active in sports, were 40 percent more likely to die than bikers.”
- “For every year of life lost to a bike crash, twenty years of life are gained from stress reduction, greater cardiovascular fitness, and improved mental health.”
- Per mile traveled, >3x as
- many pedestrians die from
- auto collisions than do
- cyclists.

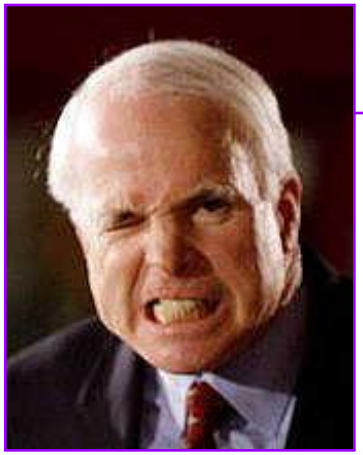
Steve Miller

Types of Cyclists

Strong and fearless

Enthused and confident





“No way, no how”

Interested but concerned

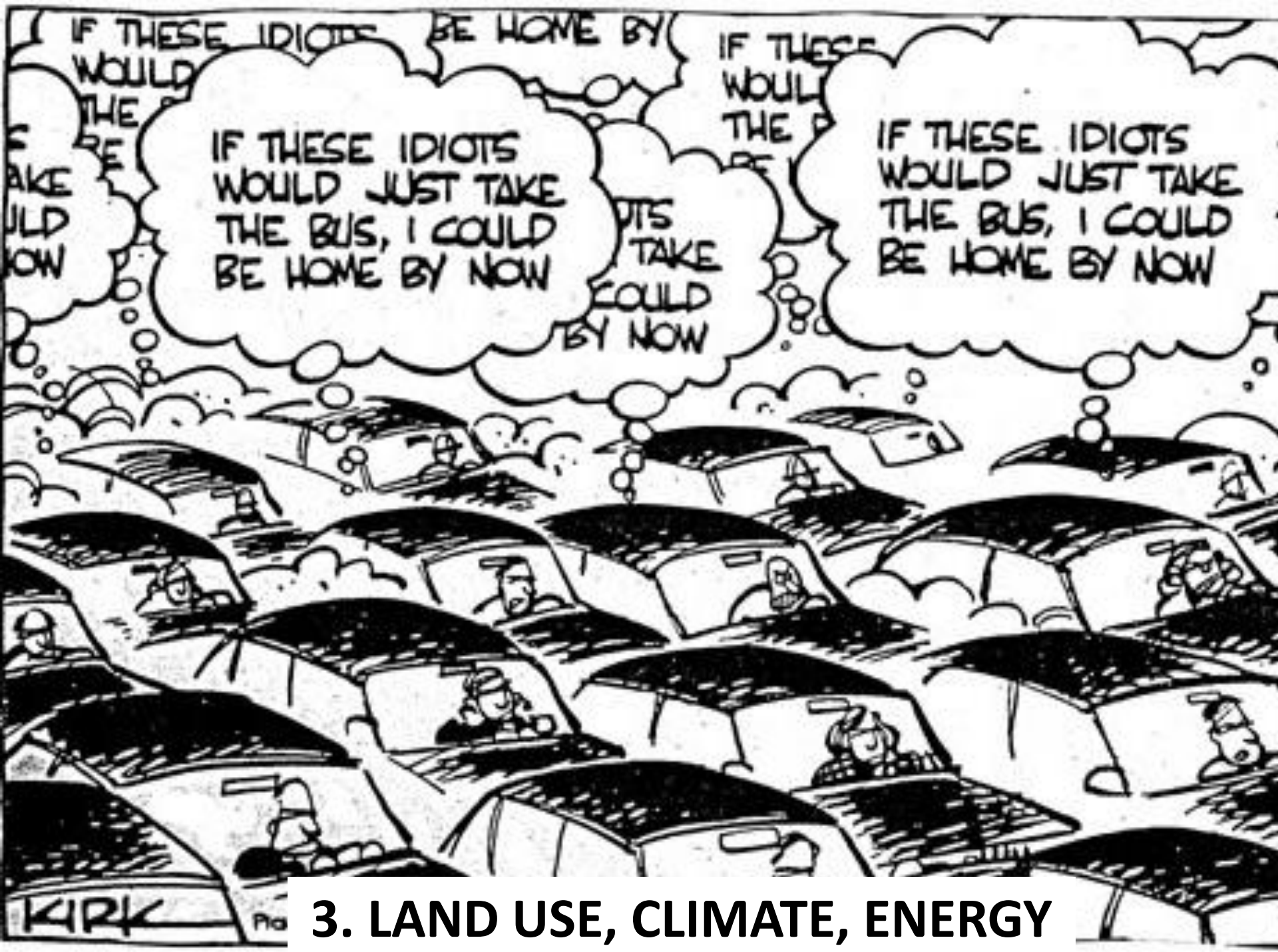
From 8 to 80

2. HEALTH: Air Pollution

2014 – NHTSA estimate: 27,200 traffic fatalities.
53,000 annual "premature deaths" from "road transportation emissions"

Combustion-caused particles cause up to 15% of all US death each year:
and take about 2 years off the average life span.

Transportation related air quality health costs -- $50 to $80 billion a year



3. LAND USE, CLIMATE, ENERGY

4. HEALTH: Social Interaction

Traveling **by car** (looking through a windshield)…
…passers-by were described as having more "**negative** characteristics (threatening, unpleasant)"

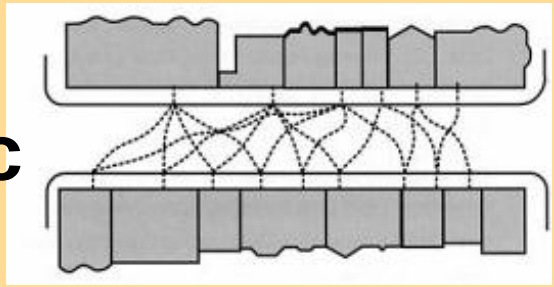
Traveling **by foot, bicycle, or transit**…
…passers-by were described as "higher on **positive** characteristics (considerate, well-educated)."

More traffic means fewer friends

light traffic

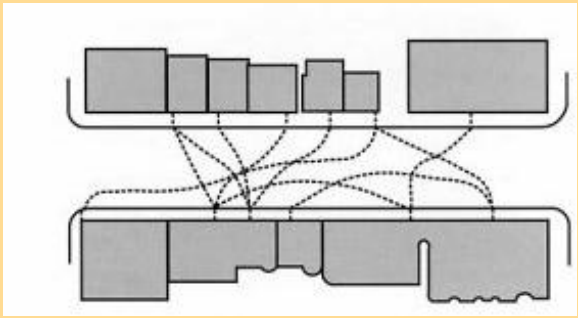
+3 friends

medium traffic



+1.9 friends

heavy traffic



+0.9 friends

Source: Donald Appleyard, Livable Streets, University of California Press, Berkeley, 1981.

Connections: Transportation Demand Management Measures (Camb. MA)

Robust	Moderate	Weaker
Market-rate parking OR cash-out/ Transportation Benefit	Pre-tax transit purchase	Shower/locker for walk/bike employees
Daily parking rate equal to a portion of monthly rate, not monthly parking pass	Bus shelters	Bike buddy matching
Free shuttle, private or EZRide	Bike parking for 10% of site users	Loaner umbrellas
100% Transit subsidy	Bike repair service	MassRIDES ridematching
Park-and-ride reimbursement	Loaner bicycles	Promotion of location and convenience to public transportation on brochures, website, other materials
Subsidy for walkers and bicyclists	Elevator large enough for 2 bikes placed horizontally on the floor	Transportation Coordinator
Vanpool subsidy	10% HOV preferential parking spaces	New student and employee transportation info packet
Employees paid for days they carpool	Annual transportation information event	Transportation Info bulletin board in central location, intranet
HOV parking discount	Car-share parking spaces	Transportation Management Association membership
Raffle for non-SOV employees	EV charging station--Level 2 or higher	Emergency Ride Home Program
		Flexible work hours or telecommuting
		Office of Workforce Development

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1. Physical Activity
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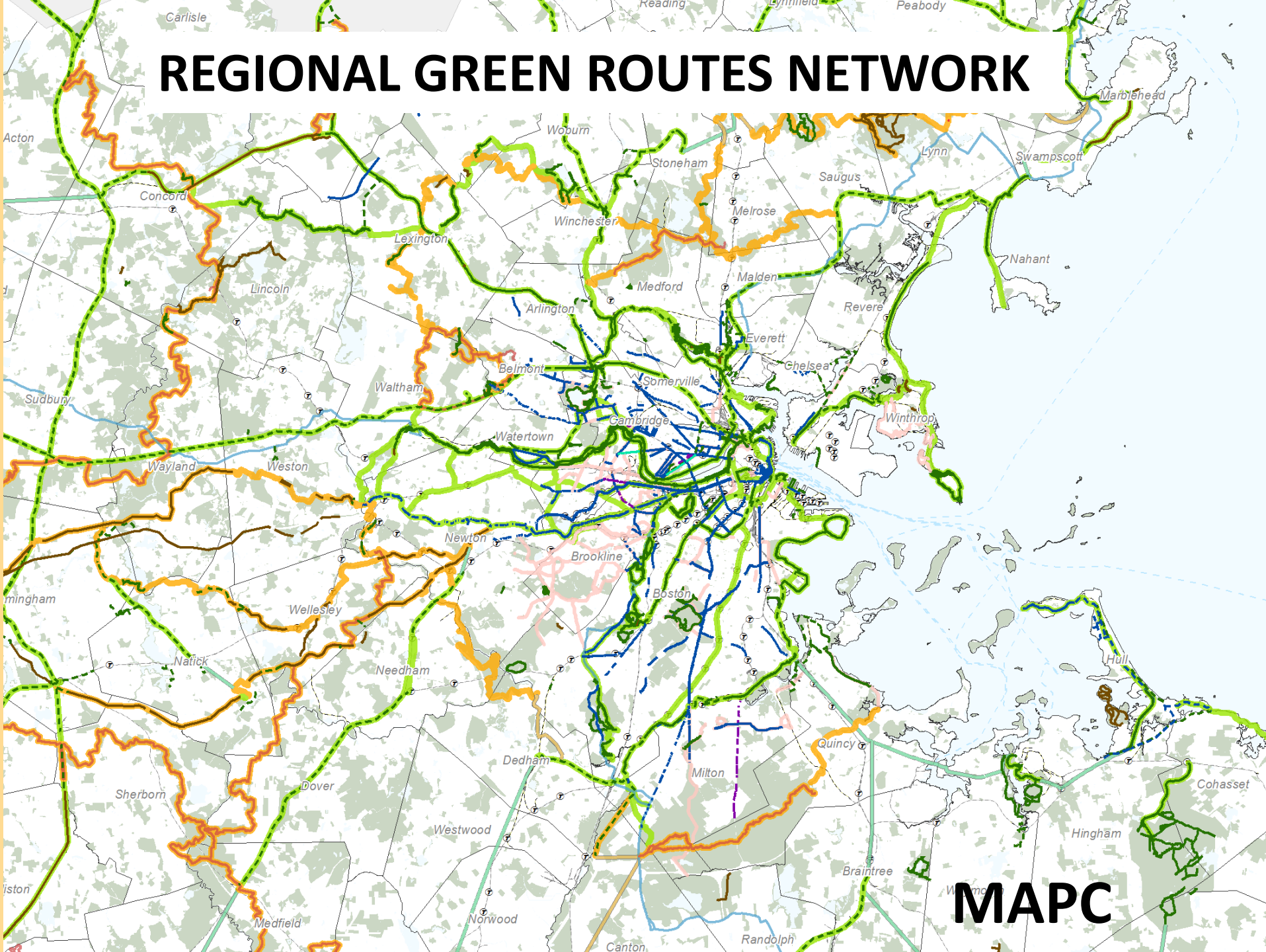
CITY OF BOSTON BICYCLE NETWORK PLAN – 30 YR BUILD OUT

E. MOVING ON ….FROM SEGMENTS TO NETWORKS

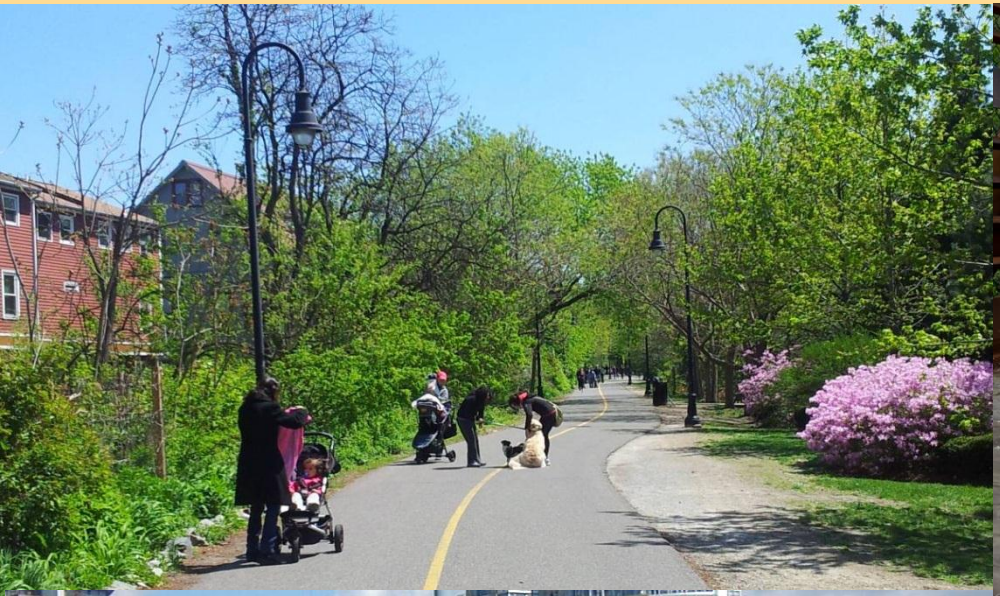
CONNECT HISTORIC BOSTON

REGIONAL GREEN ROUTES NETWORK



MAPC

GREENWAYS



CONNECTORS – GAPS & LINKS

Turn Lower Volume Streets into Bicycle Boulevards

A street suitable for through cycling, but NOT suitable for through driving

Diverters and Other Permeable Barriers
Alternating One-Way, with Bicycle Contraflow

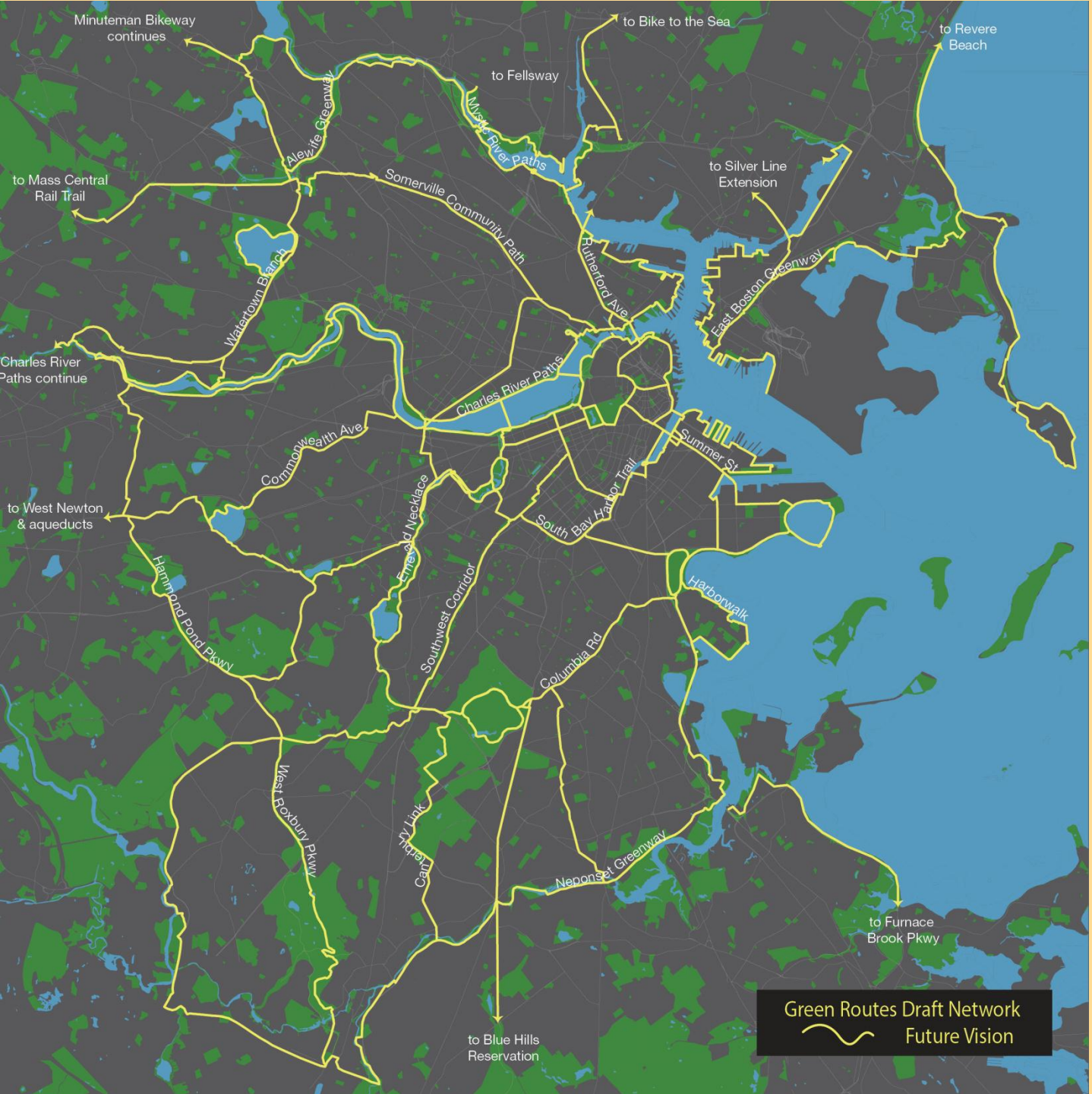
Credit:
Peter Furth

Build New Connections

Davis, CA: Home purchased and removed to create path connector between two quiet streets

Netherlands: New $90,000 footbridge links local streets to create a great bike route

Credit:
Peter Furth



Dense enough
to be
comprehensive;
Simple enough
to be
comprehensible.

Big enough
to be
Inspirational;
Small enough
to be
believable.

USEFUL

Social connections
Commuting
Traffic alternative

PLAYFUL

Recreation
Family fun
Access to Nature
Health

CATALYTIC

“Sustainable transportation is key to sustainable development.”

Livability

If you plan for cars and traffic,
you get cars and traffic.

If you plan for people and places, you get people and places.

- Fred Kent, Project for Public Spaces

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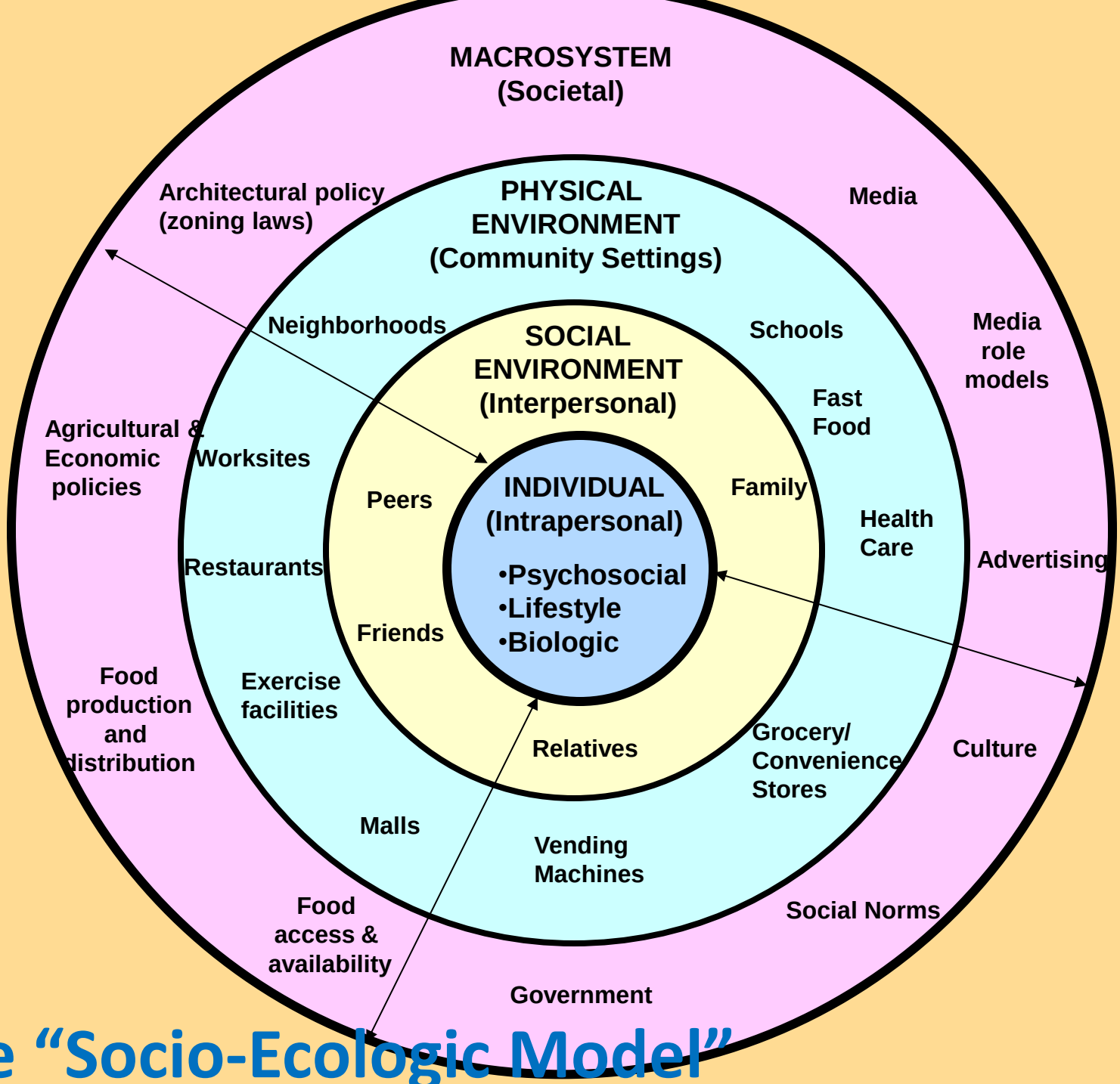

The "Socio-Ecologic Model"

PLANNING CONSIDERATIONS

1. Desire Lines…(network value)….increased useage

2. Leveraging Ratio….new seamless distance covered

3. Pattern….creates a legible pattern of “loops and lines”

4. Social Equity…underserved proximity and access

FEASIBILITY ISSUES

1. Level of Public & Agency Support

2. Funding: direct or as part of other project

3. Alignment with existing Right Of Way

4. Technical difficulty of first steps and final vision

Bike/Ped Facility Myths

- Rail-to-Trail paths create trash
  - vs. filth on abandoned ROW
- Off-road facilities attract crime
  - vs. creating more “eyes on the street”
- Bike facilities reduce property values
  - Parking, noise, loss of privacy…
    - vs. 10% to 25% increase, tied to proximity
- No equipment or staff for maintenance
  - vs. volunteers and shifting priority

MY CAMPAIGN PLATFORM

- Better Health
  - less asthma, diabetes, high blood pressure
  - stronger bones, muscles
  - greater fitness, feeling of wellbeing
  - less dementia, heart attacks, strokes
- Less Crime
- Better School Performance
- Cleaner Environment
- Reduced Greenhouse Gases
- Less War
- Better Looking Communities
- Friendlier Neighborhoods
- More Prosperous Business District

Active Transportation

TRANSIT

- Sheltered Bus Stops
- Bus Priority at Traffic Lights

ENVIRONMENT

- Water: storm run-off, swales for pollution dilution. Permeable pavement.
- Air: idling
- Noise: less!
- Greenery: trees, shrubs, weed!

SOCIAL - CULTURAL

- Space to rest, meet, talk, enjoy
- Café's, Concerts, Play
- Right of Way is Public Space

PARKING

- Keep in main street to narrow lanes and/or provide buffer for bikes
- Move to side streets to open space on main streets.
- "Outward facing, angle"
- Market pricing; local control of funds; handicapped & elderly exceptions

MAKE DRIVING SAFER

- Less Speed: ("20 is Plenty") re-time traffic lights to preserve throughput
- Lane Diet (10' or less)
- Road Diet (cut number of lanes from 4 to 3 or 2)
- Tighter corner turning radii

PEDESTRIANS

- Sidewalks: Install, Widen, and Improve
- Maintain Pedestrian Height on driveways & small cross-streets
- Universal Design: audible & visual signals, curb ramps, 4' (or more) clearance
- Crosswalks: Fat Zebra markings (set-back stop line for cars); Mid-block
- Walk Signals: Leading Pedestrian Indicator (LPI) give 3-5 second head start, Countdown numbers avoid confusion, Flashing Crosswalks
- Corners: curb extensions, tighter turning radii, eliminate "free right" turns

BICYCLES

- Separation: Where possible, as much as possilbe – off road, cycle track, buffered, lane; contra-flow
- Parking: more! Long-term and short-term
- Network: desire line completion

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PROVEN GLOBALLY OVER 30 YEARS:
UK, European Union, Japan, China, Brazil all have mandatory sideguard laws.

IN US: Portland, Washington DC, Boston, Cambridge, Somerville, Newton, NYC – various approaches.

Pending NYC bill: **all** trucks over 26,000 lbs. and operating in NYC to install sideguards.
NY State law: **all** trucks registered in NYS over 26,000 lbs. and operating in NYC must install convex crossover mirrors for frontal blind spot

European Union sideguard law (Regulation 73)
Applies to all vehicles in the European Union over 3.5 metric tons (7,700 lbs.)
Can be met by vehicle design **or** sideguards; tool boxes, spare wheels, etc. can be integrated. Sideguards can use horizontal rails or continuous flat surface:

Flush with vehicle, smooth face, max ground clearance 550 mm / 21.7";
Standards for strength (1 kN or 225 lbs horizontal static force)

Mayor Walsh Wants 'Truck Side Guards' on All Vehicles Contracted by the City

The guards would keep cyclists from getting pulled under a vehicle's wheels in the event that a driver doesn't see them.

By Steve Annear | Boston Daily | September 9, 2014 10:13 am

NYC Citywide Administrative Services | Fleet

NYC FLEET NEWSLETTER

Bill de Blasio, Mayor
Stacey Cumberbatch, DCAS Commissioner
Keith T. Kerman, Chief Fleet Officer

MAY 16, 2014

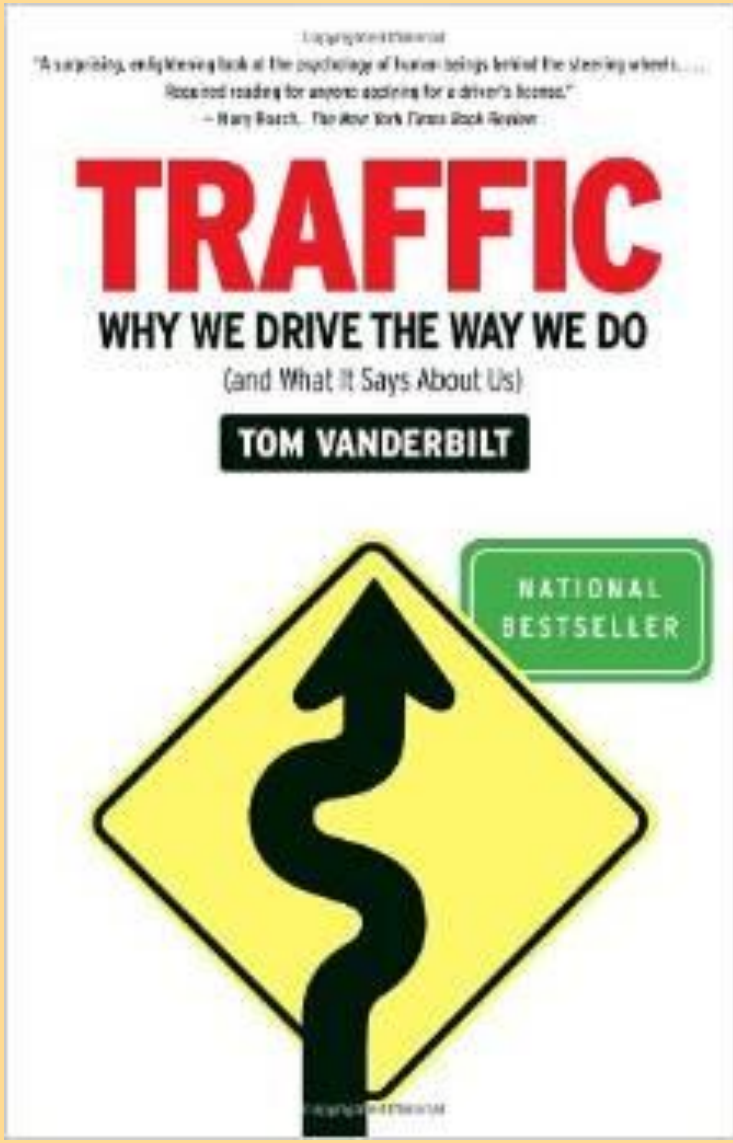
ISSUE 49

DCAS PARTNERS WITH US DOT TO STUDY TRUCK SIDE GUARDS KEITH KERMAN

INTERSECTION DETAILS

"Trixi Mirrors"
Advanced Stop Lines
Bike Boxes
Bike Lights


PLAY
STREET
NO THRU TRAFFIC
NO PARKING
IN THIS BLOCK
8AM-5PM
MON THRU FRI


TRAFFIC
WHY WE DRIVE THE WAY WE DO
(and What It Says About Us)
TOM VANDERBILT
NATIONAL
BESTSELLER